VISIT…

# TDA7253L

## 6W AMPLIFIER WITH MUTING

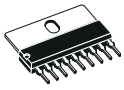
## 1 FEATURES

- WIDE SUPPLY VOLTAGE RANGE
- 6W @ $V_S$ = 20V, $R_L$ = 8Ω, THD=10%
- MUTE FACILITY (POP FREE) WITH LOW CONSUMPTION
- AC SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION (150°C

## 2 DESCRIPTION

The TDA7253L is class AB audio power amplifier assembled in the Single in Line 10 pins Package.

**Figure 1. Package**

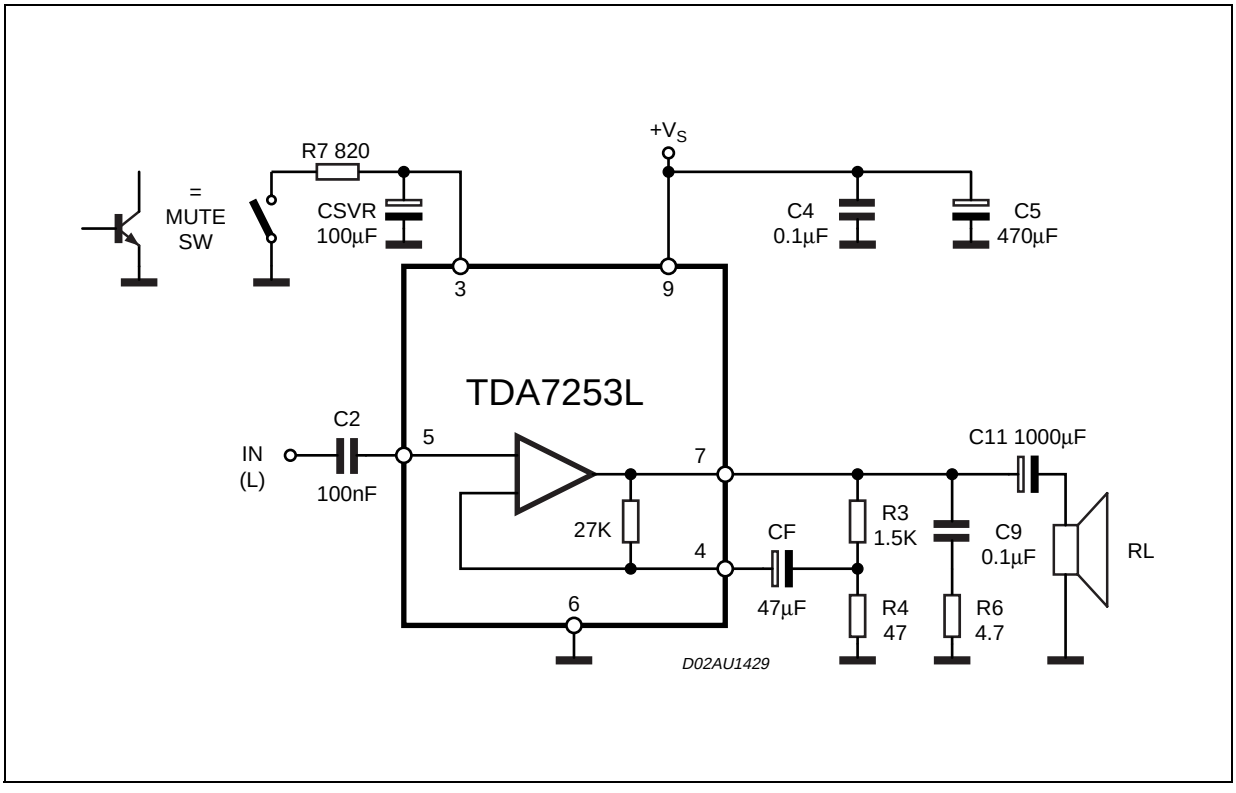


SIP10

**Table 1. Order Codes**

| Part Number | Package |
|---|---|
| TDA7253L | SIP10 |

**Figure 2. Test and Application Circuit**



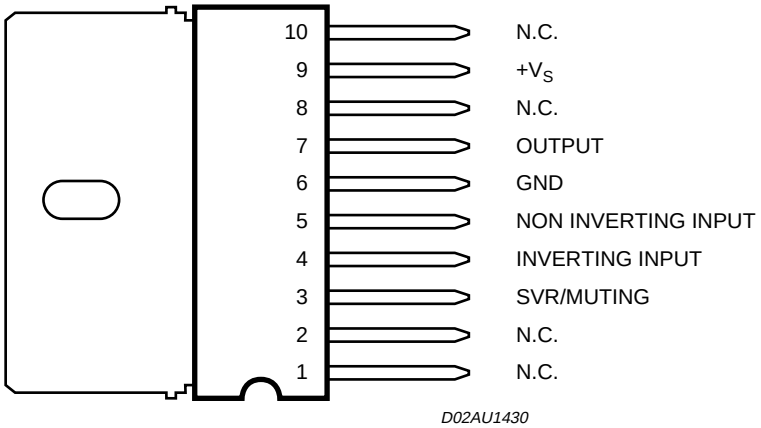
### Table 2. Absolute Maximum Ratings

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | Supply Voltage | 30 | V |
| $I_O$ | Output Peak Current (repetitive f >20Hz) | 1.7 | A |
| $I_O$ | Output Peak Current (non repetitive, t = 100µs) | 2 | A |
| $P_{tot}$ | Total Power Dissipation ($T_{case}$ = 70°C) | 8 | W |
| $T_{op}$ | Operating Temperature Range | 0 to 70 | °C |
| $T_{stg}$,$T_j$ | Storage & Junction Temperature | -40 to 150 | °C |

### Table 3. Thermal Data

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal resistance junction to case | Max | 9 | °C/W |

### Figure 3. Pin Connection (Top view)




### Figure 4. Block Diagram

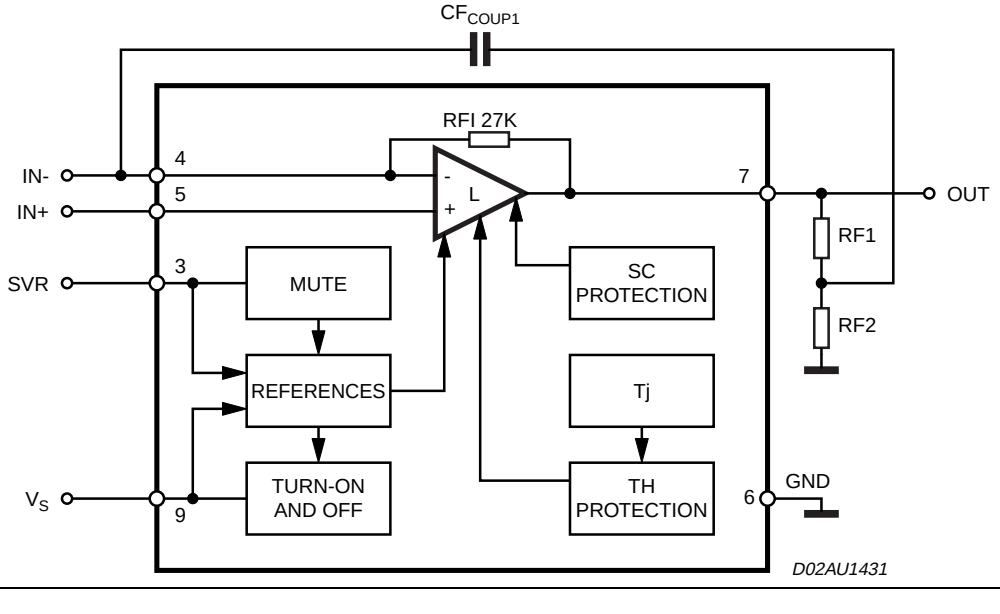


**Table 4. ELECTRICAL CHARACTERISTCS**

(Refer to the test and application circuit, $V_S$ = 20V; $R_L$ = 8Ω; $G_v$ = 30dB; f = 1KHz; $T_{amb}$ = 25°C unless otherwise specified).

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Voltage | | 10 | | 24 | V |
| $V_O$ | Quiescent Output Voltage | | | 9.5 | | V |
| $I_q$ | Total Quiescent Current | | | 30 | 60 | mA |
| $P_O$ | Output Power | d = 10% | 5 | 6 | | W |
| | | d = 1% | 4 | 5 | | W |
| d | Total Harmonic Distortion | PO = 1W | | 0.03 | 0.3 | % |
| $R_I$ | Input Resistance | | 100 | 200 | | KΩ |
| $f_L$ | Low Frequency Roll-off (-3dB) | | | 40 | | Hz |
| $f_H$ | High Frequency Roll-off (-3dB) | | | 80 | | KHz |
| $e_N$ | Total Input Noise Voltage | A Curve; $R_S$ = 10KΩ | | 2 | | mV |
| | | f = 22Hz to 22KHz; $R_S$ = 10KΩ | | 2.5 | 10 | μV |
| SVR | Supply Voltage Rejection | $R_S$ = 10KΩ; f = 100Hz; Vr = 0.5V | 46 | 60 | | dB |
| $VT_{MUTE}$ | Mute Threshold | | 1 | 1.6 | | V |
| $VT_{PLAY}$ | Play Threshold | | | 4.5 | | V |
| $A_M$ | Mute Attenuation | | 80 | 100 | | dB |
| $I_{qMUTE}$ | Quiescent Current Mute | | | 6 | 10 | mA |

Note: to avoid pop-on noise $\frac{C_F}{C_{SVR}} \leq 1$

**Figure 5. Output Power vs. Supply Voltage**

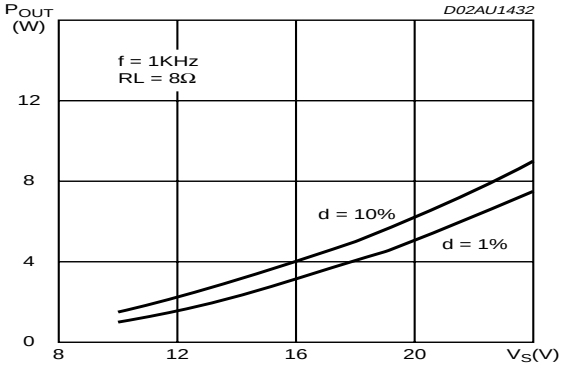



**Figure 6. Quiescent Current vs. Supply Voltage**

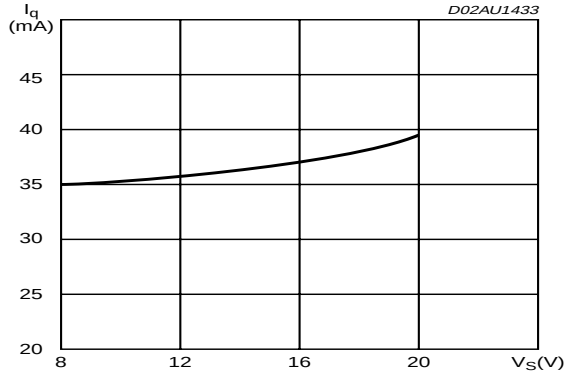



**Figure 7. Distortion vs Output Power**

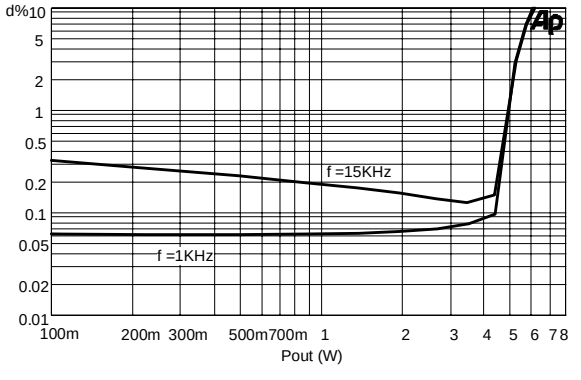


**Figure 8. PC Board Component Layout**

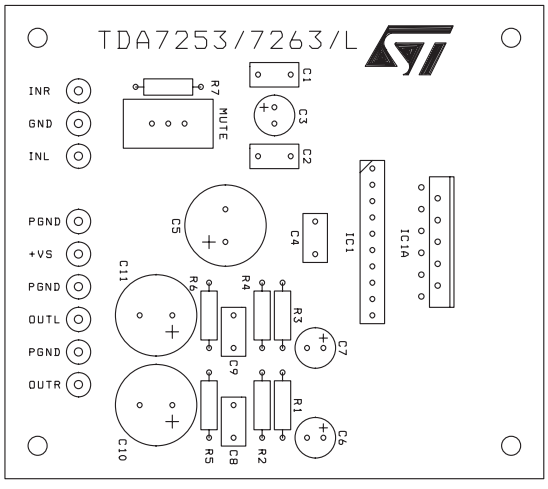



**Figure 9. Evaluation Board Top Layer Layout**

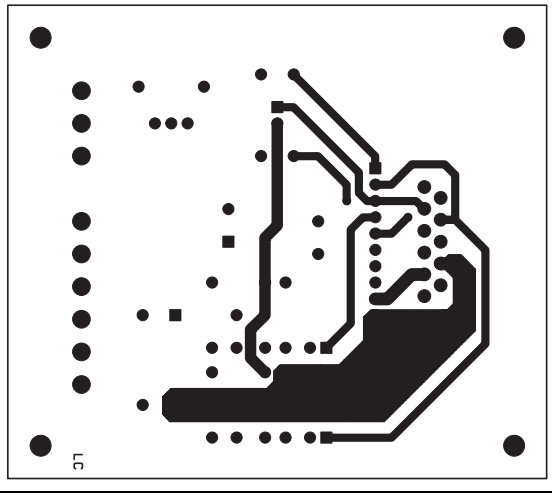
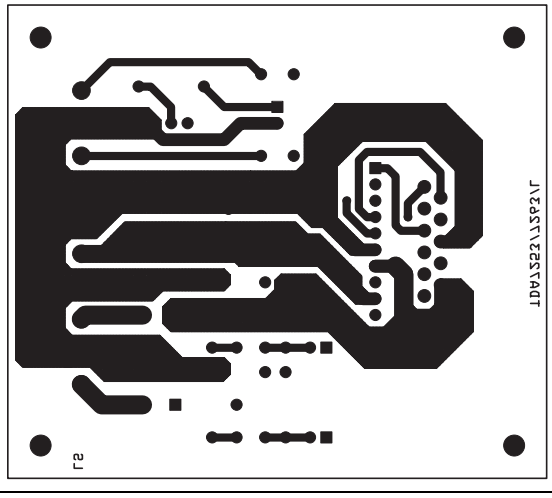


**Figure 10. Evaluation Board Bottom Layer Layout**



# 3 HEAT SINK DIMENSIONING:

In order to avoid the thermal protection intervention, that is placed approximatively at $T_j$ = 150°C, it is important the dimensioning of the Heat Sinker $R_{Th}$ (°C/W).

The parameters that influence the dimensioning are:

– Maximum dissipated power for the device ($P_{dmax}$)

– Max thermal resistance Junction to case ($R_{Th\ j\text{-}c}$)

– Max. ambient temperature $T_{amb\ max}$

– Quiescent current $I_q$ (mA)

### 3.1 Example:

$V_{CC}$ = 20V, $R_{load}$ = 8ohm, $R_{Th\ j\text{-}c}$ = 9 °C/W , $T_{amb\ max}$ = 50°C

$$P_{dmax} = (N° \text{ channels}) \cdot \frac{2V_{cc}^{2}}{\Pi^{2} \cdot R_{load}} + I_q \cdot V_{cc}$$

$P_{dmax} = 1 \cdot ( 2.5 ) + 0.5 = 3W$

$$(\text{Heat Sinker})\ R_{Th\ c\text{-}a} = \frac{150 - T_{amb\ max}}{P_{d\ max}} - R_{Th\ j\text{-}c} = \frac{150 - 50}{6} - 9 = 24.3°C/W$$

In figure 8 is shown the Power derating curve for the device.

**Figure 11. Power Derating Curve**

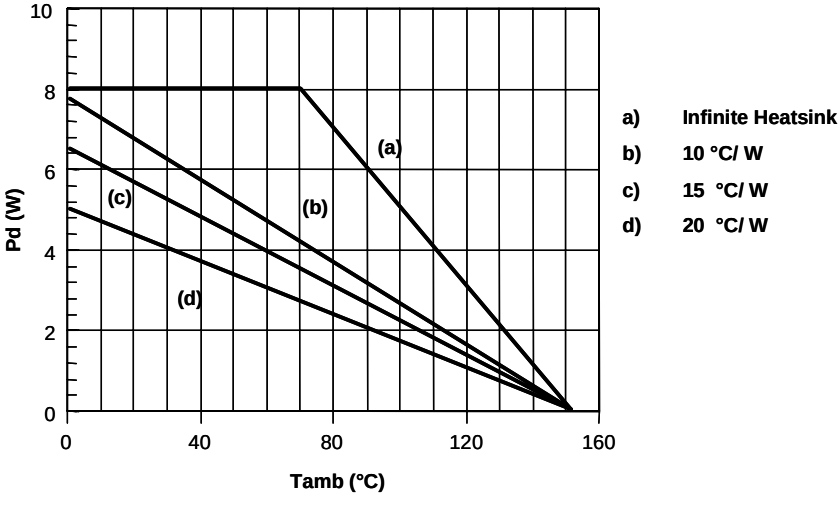
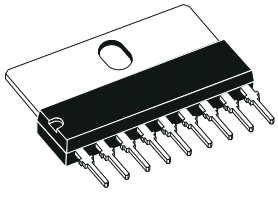


**Figure 12. SIP10 Mechanical Data & Package Dimensions**

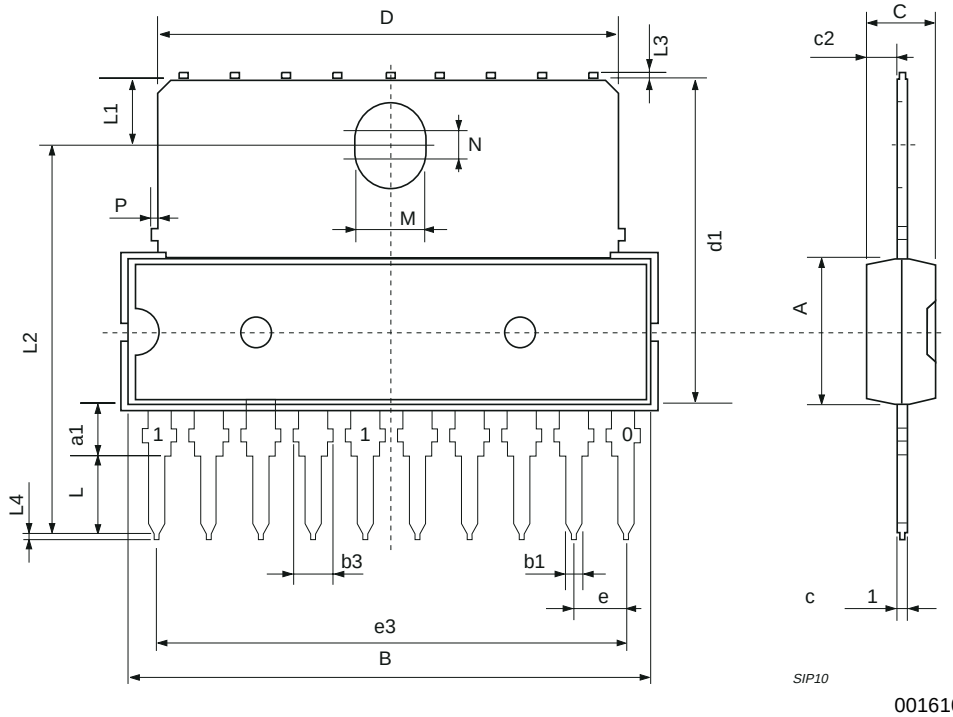
| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 7.1 | | | 0.280 |
| a1 | 2.7 | | 3 | 0.106 | | 0.118 |
| B | | | 24.8 | | | 0.976 |
| b1 | | 0.5 | | | 0.020 | |
| b3 | 0.85 | | 1.6 | 0.033 | | 0.063 |
| C | | 3.3 | | | 0.130 | |
| c1 | | 0.43 | | | 0.017 | |
| c2 | | 1.32 | | | 0.052 | |
| D | | | 23.7 | | | 0.933 |
| d1 | | 14.5 | | | 0.571 | |
| e | | 2.54 | | | 0.100 | |
| e3 | | 22.86 | | | 0.900 | |
| L | 3.1 | | | 0.122 | | |
| L1 | | 3 | | | 0.118 | |
| L2 | | 17.6 | | | 0.693 | |
| L3 | | | 0.25 | | | 0.010 |
| L4 | | | 0.254 | | | 0.010 |
| M | | 3.2 | | | 0.126 | |
| N | | 1 | | | 0.039 | |
| P | | | 0.15 | | | 0.006 |

**OUTLINE AND MECHANICAL DATA**

**Weight:** 2.02gr



**SIP10**




0016108 D

**Table 5. Revision History**

| Date | Revision | Description of Changes |
|---|---|---|
| June 2003 | 1 | First Issue |
| September 2004 | 2 | Changed Status and the graphic aspect in compliant to the new rules “Corporate Technical Pubblications Design Guide” |

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